

Curriculum Vitae

Eriks Rozners

Department of Chemistry
Binghamton University
Binghamton, NY 13902

Office: (607) 777-2441
Fax: (607) 777-4478
E-mail: erozners@binghamton.edu

PROFESSIONAL EXPERIENCE

2015 – present	Professor	Department of Chemistry, Binghamton University
2017 – 2023	Chairman	Department of Chemistry, Binghamton University
2008 – 2015	Associate Professor	Department of Chemistry, Binghamton University
2001 – 2008	Assistant Professor	Department of Chemistry and Chemical Biology Northeastern University

EDUCATION AND TRAINING

University of Wisconsin, Madison and University of Michigan	Postdoctoral Fellow Research Advisor: Prof. Edvin Vedejs	1997-2000
Stockholm University and Karolinska Institute	Postdoctoral Fellow Research Advisor: Prof. Roger Strömberg	1994-1997
Riga Technical University	Doctor of Chemistry (equivalent of Ph.D.) in Organic Chemistry Thesis "Studies on the 2'-O-Aroyl Protecting Groups in Oligoribonucleotide Synthesis" Research Advisor: Prof. Erika Bizdena	1993
Riga Technical University	Degree in Chemical Engineering (equivalent of MS) with honors Undergraduate research on base labile protecting groups for RNA synthesis Research Advisor: Prof. Erika Bizdena	1990

HONORS AND AWARDS

2021	American Chemical Society (ACS), Division of Carbohydrate Chemistry, Melville L. Wolfrom Award.
2021	ACS, Binghamton Local Section, Distinguished Research Award.
2016	SUNY Chancellor's Award for Excellence in Scholarship and Creative Activities.

OTHER EXPERIENCE AND PROFESSIONAL ACTIVITIES

2023	Co-Vice Chair, Nucleosides, Nucleotides and Oligonucleotides Gordon Research Conference.
2023 – present	Member of International Scientific Advisory Board, Latvian Institute of Organic Synthesis.
2022 – present	Organizing Committee member, Balticum Organicum Syntheticum (BOS) conferences.
2022 – present	Scientific Advisory Board member, Korro Bio, Inc.
2020 – 2023	Scientific Advisory Board member, NeuBase Therapeutics, Inc.
2018 – present	Elected Foreign Member, Latvian Academy of Sciences, Latvia.
2016 – 2020	Standing Member, SBCA Study Section, National Institutes of Health.
2016 – 2019	Chair Elect, Chair, and Immediate Past Chair, Division of Carbohydrate Chemistry, ACS.
2014 – present	Ad Hoc Reviewer for National Science Foundation. Participated in five panel meetings since 2014.
2014 – 2015	Executive Secretary and Program Chair, Division of Carbohydrate Chemistry, ACS.
2012 – 2013	Secretary, Division of Carbohydrate Chemistry, ACS.
2012 – 2017	Member of Editorial Board, <i>Journal of Biological Chemistry</i> .
2009 – present	Ad Hoc Reviewer for National Institutes of Health SBCA, EBIT, IMST and BCMB study sections. Participated in 21 study sections since 2009.

CURRENT RESEARCH SUPPORT

- **MIRA R35 GM130207** "Chemical Approaches to Control the Function of Regulatory RNAs"
National Institutes of Health, National Institute of General Medical Sciences.
Period: **2/1/2019 – 1/31/2024**, current annual direct costs **\$355,553**.
- **CHE-2107900** "Collaborative Research: Nucleobase-Modified PNA for Sequence Selective Triple-Helical Recognition of Non-Coding RNA"
National Science Foundation, Chemistry Division.
Period: **08/01/2021 – 07/31/2024**, current annual direct costs **\$113,312**.
- **R21 AI165377** "Targeting SARS-CoV-2 RNA Pseudoknots Using Triplex-Forming Peptide Nucleic Acids"
National Institutes of Health, National Institute of Allergy and Infectious Diseases.
Period: **11/1/2021 – 10/31/2023**, current annual direct costs **\$150,000**.

RECENTLY ACCOMPLISHED PROJECTS

- **CHE-1708761** "Collaborative Research: Nucleobase-Modified Peptide Nucleic Acid (PNA) for Sequence Selective Triple-Helical Recognition of Non-Coding Ribonucleic Acid (RNA)"
National Science Foundation, Chemistry Division.
Period: **08/01/2017 – 07/31/2021**, total costs **\$534,985**.
- **R01 GM071461** "Amide-Modified RNA: Synthesis, Structure and Potential for RNA Interference"
National Institutes of Health, National Institute of General Medical Sciences.
Period: **3/1/2007 – 3/31/2019**, total costs **~\$3,175,000**.
- **CHE-1406433** "Collaborative Research: Sequence Selective Recognition of Double-Stranded Non-Coding RNA via Triplex Forming PNA"
National Science Foundation, Chemistry Division.
Period: **08/01/2014 – 07/31/2018**, total costs **\$433,767**.
- **Co-PI on CBET- 1919830 (PI, Sha Jin)** "MRI: Acquisition of a High-throughput Flow Cytometry for Health Science Research and Training"
National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems.
Period: **09/15/2019 – 08/31/2022**, total costs **\$ 346,502**.
- **Co-PI on CBET-1531944 (PI, Kaiming Ye)** "MRI: Acquisition of A Multiphoton Confocal Laser Scanning Microscope for Life Science and Biomedical Research and Training at SUNY Binghamton"
National Science Foundation, Division of Chemical, Bioengineering, Environmental, and Transport Systems.
Period: **09/15/2015 – 08/31/2018**, total costs **\$610,868**.
- **CHE-0922815** "MRI: Acquisition of 600 MHz NMR Spectrometer for Regional NMR Facility"
National Science Foundation, Chemistry Division.
Period: **08/01/2009 – 07/31/2012**, total costs **\$550,584**.

PEER-REVIEWED RESEARCH PUBLICATIONS

1. Pallan, P. S.; Lybrand, T. P.; **Rozners, E.**; Abramov, M.; Schepers, G.; Eremeeva, E.; Herdewijn, P.; Egli,* M., Conformational Morphing by a DNA Analogue Featuring 7-Deazapurines and 5-Halogenpyrimidines and the Origins of Adenine-Tract Geometry. *Biochemistry* **2023**, <https://doi.org/10.1021/acs.biochem.3c00327>.
2. Talbott, J. M.; Tessier, B. R.; Harding, E. E.; Walby, G. D.; Hess, K. J.; Baskevics, V.; Katkevics, M.; **Rozners, E.**; MacKay,* J. A., Improved Triplex-Forming Isoorotamide PNA Nucleobases for A-U Recognition of RNA Duplexes. *Chem. Eur. J.* **2023**, e202302390.
3. Kumpina, I.; Baskevics, V.; Nguyen, K. D.; Katkevics, M.; **Rozners,* E.** Nucleobase and Linker Modification for Triple-Helical Recognition of Pyrimidines in RNA Using Peptide Nucleic Acids. *ChemBioChem* **2023**, *24*, e202300291.
4. Ryan, C. A.; Rahman, M. M.; Kumar, V.; **Rozners,* E.** Triplex-Forming Peptide Nucleic Acid Controls Dynamic Conformations of RNA Bulges. *J. Am. Chem. Soc.* **2023**, *145*, 10497–10504.
5. Richter, M.; Viel, J. A.; Kotikam, V.; Gajula, P. K.; Coyle, L.; Pal, C.; **Rozners,* E.** Amide Modifications in the Seed Region of the Guide Strand Improve the On-Target Specificity of Short Interfering RNA. *ACS Chem. Biol.* **2023**, *18*, 7-11.
6. Ryan, C. A.; Baskevics, V.; Katkevics, M.; **Rozners,* E.** Extended 2-Guanidyl Pyridine PNA Nucleobase for Triple-Helical Hoogsteen Recognition of Cytosine in Double Stranded RNA. *Chem. Commun.* **2022**, *58*, 7148-7151.
7. Viel, J. A.; Pal, C.; **Rozners,* E.** Optimization of Automated Synthesis of Amide-Linked RNA. *ACS Omega* **2022**, *7*, 20420–20427.
8. Kotikam, V.; Gajula, P. K.; Coyle, L.; **Rozners,* E.** Amide Internucleoside Linkages Are Well Tolerated in Protospacer Adjacent Motif-Distal Region of CRISPR RNAs. *ACS Chem. Biol.* **2022**, *17*, 509-512.
9. Brogyagin, N.; Kataoka, Y.; Kumpina, I.; McGee, D. W.; **Rozners,* E.** Cellular uptake of 2-aminopyridine-modified peptide nucleic acids conjugated with cell-penetrating peptides. *Biopolymers* **2022**, *113*, e23484. <https://doi.org/10.1002/bip.23484> (**Invited contribution**).
10. Kumar, V.; **Rozners,* E.** Fluorobenzene Nucleobase Analogues for Triplex-Forming Peptide Nucleic Acids. *ChemBioChem* **2022**, *23*, e202100560. <https://doi.org/10.1002/cbic.202100560>
11. Zhang, X.; Kotikam, V.; **Rozners, E.**; Callahan,* B. P. Enzymatic Beacons for Specific Sensing of Dilute Nucleic Acid. *ChemBioChem* **2022**, *23*, e202100594. <https://doi.org/10.1002/cbic.202100594>
12. Endoh, T.; Brodyagin, N.; Hnedzko, D.; Sugimoto,* N.; **Rozners,* E.** Triple-Helical Binding of Peptide Nucleic Acid Inhibits Maturation of Endogenous MicroRNA-197. *ACS Chem. Biol.* **2021**, *16*, 1147-1151 (**Featured on Cover Page**).
13. Ryan, C. A.; Brodyagin, N.; Lok, J.; **Rozners,* E.** The 2-Aminopyridine Nucleobase Improves Triple-Helical Recognition of RNA and DNA When Used Instead of Pseudoisocytosine in Peptide Nucleic Acid. *Biochemistry* **2021**, *60*, 1919-1925.
14. Brodyagin, N.; Kumpina, I.; Applegate, J.; Katkevics, M.; **Rozners,* E.** Pyridazine Nucleobase in Triplex-Forming PNA Improves Recognition of Cytosine Interruptions of Polypurine Tracts in RNA. *ACS Chem. Biol.* **2021**, *16*, 872-881.
15. Brodyagin, N.; Maryniak, A. L.; Kumpina, I.; Talbott, J. M.; Katkevics, M.; **Rozners, E.**; MacKay,* J. A. Extended Peptide Nucleic Acid Nucleobases Based on Isoorotic Acid for the Recognition of A-U Base Pairs in Double-Stranded RNA. *Chem. Eur. J.* **2021**, *27*, 4332-4335.
16. Kumar, V.; Brodyagin, N.; **Rozners,* E.** Triplex-Forming Peptide Nucleic Acids with Extended Backbones. *ChemBioChem* **2020**, *21*, 3410-3416.
17. Ryan, C. A.; **Rozners,* E.** Impact of Chirality and Position of Lysine Conjugation in Triplex-Forming Peptide Nucleic Acids. *ACS Omega* **2020**, *5*, 28722–28729.
18. Kotikam, V.; Viel, J. A.; **Rozners,* E.** Synthesis and Biological Activity of Short Interfering RNAs Having Several Consecutive Amide Internucleoside Linkages. *Chem. Eur. J.* **2020**, *26*, 685-690.

19. Kumpina, I.; Brodyagin, N.; MacKay, J. A.; Kennedy, S. D.; Katkevics, M.; **Rozners,* E.** Synthesis and RNA binding properties of extended nucleobases for triplex-forming peptide nucleic acids. *J. Org. Chem.* **2019**, *84*, 13276–13298.
20. Kotikam, V.; Kennedy, S. D.; MacKay, J. A.; **Rozners,* E.** Synthetic, Structural, and RNA Binding Studies on 2-Aminopyridine-Modified Triplex-Forming Peptide Nucleic Acids. *Chem. Eur. J.* **2019**, *25*, 4367-4372. (**Very Important Paper & Featured on Cover Page**)
21. Hardcastle, T.; Novosjolova, I.; Kotikam, V.; Cheruiyot, S. K.; Mutisya, D.; Kennedy, S. D.; Egli, M.; Kelley, M. L.; Smith, A. v. B.; **Rozners,* E.** A Single Amide Linkage in the Passenger Strand Suppresses Its Activity and Enhances Guide Strand Targeting of siRNAs. *ACS Chem. Biol.* **2018**, *13*, 533 – 536.
22. Novosjolova, I.; Kennedy, S. D.; **Rozners,* E.** 2-Methoxypyridine as a Thymidine Mimic in Watson–Crick Base Pairs of DNA and PNA: Synthesis, Thermal Stability, and NMR Structural Studies. *ChemBioChem.* **2017**, *18*, 2165-2170.
23. Kotikam,* V.; **Rozners,* E.** Concurrent Hydrogenation of Three Functional Groups Enables Synthesis of C3'-Homologated Nucleoside Amino Acids. *Org. Lett.* **2017**, *19*, 4122-4125.
24. Mutisya, D.; Hardcastle, T.; Cheruiyot, S. K.; Pallan, P. S.; Kennedy, S. D.; Egli, M.; Kelley, M. L.; Smith, A. v. B.; **Rozners,* E.** Amide linkages mimic phosphates in RNA interactions with proteins and are well tolerated in the guide strand of short interfering RNAs. *Nucleic Acids Res.* **2017**, *45*, 8142-8155.
25. Hnedzko,* D.; McGee, D. W.; Karamitas, Y. A.; **Rozners,* E.** Sequence-Selective Recognition of Double-Stranded RNA and Enhanced Cellular Uptake of Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids. *RNA* **2017**, *23*, 58-69.
26. Endoh, T.; Annoni, C.; Hnedzko, D.; **Rozners, E.**; Sugimoto,* N. Triplex-forming PNA modified with unnatural nucleobases: the role of protonation entropy in RNA binding. *Phys. Chem. Chem. Phys.* **2016**, *18*, 32002-32006.
27. Hnedzko, D.; McGee, D. W.; **Rozners,* E.** Synthesis and properties of peptide nucleic acid labeled at the N-terminus with HiLyte Fluor 488 fluorescent dye. *Bioorg. Med. Chem.* **2016**, *24*, 4199-4205.
28. Cheruiyot, S. K.; **Rozners,* E.** Fluorescent 2-Aminopyridine Nucleobases for Triplex-Forming Peptide Nucleic Acids. *ChemBioChem* **2016**, *17*, 1558-1562.
29. Anosova, I.; Kowal, E. A.; Sisco, N. J.; Sau, S.; Liao, J.-Y.; Bala, S.; **Rozners, E.**; Egli, M.; Chaput, J. C.; Van Horn,* W. D. Structural Insights into Conformation Differences between DNA/TNA and RNA/TNA Chimeric Duplexes. *ChemBioChem* **2016**, *17*, 1705-1708.
30. Annoni, C.; Endoh, T.; Hnedzko, D.; **Rozners, E.** Sugimoto,* N. Triplex-forming peptide nucleic acid modified with 2-aminopyridine as a new tool for detection of A-to-I editing. *Chem. Commun.*, **2016**, *52*, 7935-7938.
31. Endoh, E.; Hnedzko, D.; **Rozners, E.** Sugimoto,* N. Nucleobase-modified PNA suppresses translation by forming triple helix with a hairpin structure in mRNA in vitro and in cells. *Angew. Chem., Int. Ed.*, **2016**, *55*, 899-903 (**Featured on Cover Page**).
32. Tse, J.; Wang, Y.; Zengeya, T.; **Rozners, E.**; Tan-Wilson,* A. Peptide nucleic acid probe for protein affinity purification based on biotin-streptavidin interaction and PNA-strand hybridization. *Anal. Biochem.* **2015**, *470*, 34-40.
33. Mutisya, D.; Selvam, C.; Lunstad, B. D.; Pallan, P. S.; Haas, A.; Leake, D.; Egli,* M.; **Rozners,* E.** Amides Are Excellent Mimics of Phosphate Internucleoside Linkages and Are Well Tolerated in Short Interfering RNAs. *Nucleic Acid Res.* **2014**, *42*, 6542-6551.
34. Tanui, P., Kennedy, S.D., Lunstad, B.D., Haas, A., Leake, D. and **Rozners,* E.** Synthesis, biophysical studies and RNA interference activity of RNA having three consecutive amide linkages. *Org. Biomol. Chem.* **2014**, *12*, 1207-1210.
35. Zengeya,* T.; Gindin, A.; **Rozners, E.** Improvement of Sequence Selectivity in Triple Helical Recognition of RNA by Phenylalanine-Derived PNA. *Artificial DNA: PNA & XNA* **2013**, *4*, (3) 1-8 (Invited Manuscript).
36. Muse, O.; Zengeya, T.; Mwaura, J.; Hnedzko, D.; McGee, D. W.; Grewer, C. T.; **Rozners,* E.** Conjugation of Peptide Nucleic Acid with Cationic Peptide Enhances Recognition of Double Helical RNA at Physiologically Relevant Conditions. *ACS Chem. Biol.* **2013**, *8*, 1683-1686.

37. Walsh, J. M.; Ippoliti, P. J.; Ronayne, E. A.; **Rozners, E.**; Beuning,* P. J., Discrimination against major groove adducts by Y-family polymerases of the DinB subfamily. *DNA Repair* **2013**, *12*, 713-722.
38. Zenggeya, T.; Gupta, P.; **Rozners,* E.** Triple Helical Recognition of RNA Using 2-Aminopyridine-Modified PNA at Physiologically Relevant Conditions. *Angew. Chem., Int. Ed.* **2012**, *51*, 12593-12596 (**Very Important Paper**).
39. Patra, A.; Paolillo, M.; Charisse, K.; Manoharan, M.; **Rozners,* E.**; Egli,* M. 2'-Fluoro RNA Shows Increased Watson-Crick H-Bonding Strength and Stacking Relative to RNA: Evidence from NMR and Thermodynamic Data. *Angew. Chem., Int. Ed.* **2012**, *51*, 11863-11866.
40. Walsh, J. M.; Parasuram, R.; Rajput, P. R.; **Rozners, E.**; Ondrechen, M. J.; Beuning,* P. J., Effects of non-catalytic, distal amino acid residues on activity of E. coli DinB (DNA polymerase IV). *Environ. Mol. Mutagen.* **2012**, *53* (9), 766-776.
41. Gupta, P.; Muse, O., **Rozners,* E.** Recognition of Double Stranded RNA by Guanidine-Modified Peptide Nucleic Acids (GPNA). *Biochemistry*, **2012**, *51*, 63-73.
42. Gupta, P.; Zenggeya, T., **Rozners,* E.** Triple Helical Recognition of Pyrimidine Inversions in Polypurine Tracts of RNA by Nucleobase-modified PNA *Chem. Commun.* **2011**, *47*, 11125-11127.
43. Mutisya, D.; Selvam, C.; Kennedy, S. D.; **Rozners,* E.** Synthesis and properties of triazole-linked RNA. *Bioorg. Med. Chem. Lett.* **2011**, *21*, 3420-3422.
44. Pallan, P.S.; Greene, E. M.; Jicman, P. A.; Pandey, R. K.; Manoharan, M.; **Rozners,* E.**; Egli,* M. Unexpected origins of the enhanced pairing affinity of 2'-fluoro-modified RNA. *Nucleic Acids Res.* **2011**, *39*, 3482-3495.
45. Zenggeya, T.; Li, M.; **Rozners,* E.** PNA containing isocytidine nucleobase: synthesis and recognition of double helical RNA. *Bioorg. Med. Chem. Lett.* **2011**, *21*, 2121-2124.
46. Selvam, C.; Thomas, S.; Abbott, J.; Kennedy, S. D.; **Rozners,* E.** Amides Are Excellent Mimics of Phosphate Linkages in RNA *Angew. Chem. Int. Ed.* **2011**, *50*, 2068-2070.
47. Manoharan,* M.; Akinc, A.; Pandey, R. K.; Qin, J.; Hadwiger, P.; John, M.; Mills, K.; Charisse, K.; Maier, M. A.; Nechev, L.; Greene, E. M.; Pallan, P. S.; **Rozners, E.**; Rajeev, K. G.; Egli,* M. Unique Gene-silencing and Structural Properties of 2'-F Modified siRNAs. *Angew. Chem. Int. Ed.* **2011**, *50*, 2284-2288 (Featured as a Hot Paper chosen by the Editors).
48. Li, M.; Zenggeya, T.; **Rozners,* E.** Short Peptide Nucleic Acids Bind Strongly to Homopurine Tract of Double Helical RNA at pH 5.5. *J. Am. Chem. Soc.* **2010**, *132*, 8676-8681.
49. Tanui, P.; Kullberg, M.; Song, N.; Chivate, Y.; **Rozners,* E.** Monomers for preparation of amide linked RNA: synthesis of C3'-homologated nucleoside amino acids from D-xylose. *Tetrahedron* **2010**, *66*, 4961-4964.
50. Kolarovic, A.; Schweizer, E.; Greene, E.; Gironda, M.; Pallan, P. S.; Egli, M.; **Rozners,* E.** Interplay of Structure, Hydration and Thermal Stability in Formacetal Modified Oligonucleotides: RNA May Tolerate Nonionic Modifications Better than DNA. *J. Am. Chem. Soc.* **2009**, *131*, 14932-14937.
51. Li, F.; Pallan, P.; Maier, M.; Rajeev, K.; Mathieu, S.; Kreutz, C.; Fan, Y.; Sanghvi, J.; Micura, R.; **Rozners, E.**; Manoharan, M.; Egli,* M. Crystal structure, stability and in vitro RNAi activity of oligoribonucleotides containing the ribo-difluorotoluy nucleotide: insights into substrate requirements by the human RISC Ago2 enzyme *Nucleic Acids Res.*, **2007**, *35*, 6424-6438.
52. Donahue, C. P.; Ni, J.; **Rozners, E.**; Glicksman, M.; Wolfe,* M. S. Identification of Tau Stem Loop RNA Stabilizers. *J. Biomol. Screen.* **2007**, *12*, 789-799.
53. **Rozners,* E.**; Katkevica, D.; Strömberg, R. Oligoribonucleotide Analogues Having a Mixed Backbone of Phosphodiester and Formacetal Internucleoside Linkages with Vicinal 2'-O-Methyl Groups. *ChemBioChem* **2007**, *8*, 537-545 (Featured on Cover Page).
54. Xu, Q.; Katkevica, D.; **Rozners,* E.** Toward Amide Modified RNA: Synthesis of 3'-Aminomethyl-5'-Carboxy-3',5'-Dideoxy Nucleosides. *J. Org. Chem.* **2006**, *71*, 5906-5913.
55. **Rozners,* E.**; Smicius R.; Uchiyama, C. Expanding Functionality of RNA: Synthesis and Properties of RNA Containing Imidazole Modified Tandem G-U Wobble Base Pairs. *Chem. Commun.* **2005**, 5778-5780.
56. **Rozners,* E.**; Liu, Y. Monomers for Preparation of Amide Linked RNA: Asymmetric Synthesis of All Four Nucleoside 5'-Azido 3'-Carboxylic Acids. *J. Org. Chem.* **2005**, *70*, 9841-9848.

57. Xu, Q.; **Rozners,* E.** Asymmetric Synthesis of *trans*-3,4-Dialkyl- γ -butyrolactones via an Acyl-Claisen and Iodolactonization Route. *Org. Lett.* **2005**, *7*, 2821-2824.
58. **Rozners,* E.**; Fontanez, J. Enantioselective Nozaki-Hiyama Allylations Using a Multidentate Amino Alcohol as a Chiral Ligand. *Lett. Org. Chem.* **2005**, *2*, 407-409.
59. **Rozners,* E.**; Moulder, J. Hydration of Short DNA, RNA, and 2'-OMe Oligonucleotides Determined By Osmotic Stressing. *Nucleic Acids Res.* **2004**, *32*, 248-254.
60. **Rozners,* E.**; Xu, Q. Total Synthesis of 3',5'-C Branched Nucleosides. *Org. Lett.* **2003**, *5*, 3999-4001.
61. **Rozners,* E.**; Katkevica, D.; Bizdena, E.; Strömberg, R. Synthesis and Properties of RNA Analogs Having Amides as Interuridine Linkages at Selected Positions *J. Am. Chem. Soc.* **2003**, *125*, 12125-12136.
62. **Rozners,* E.**; Liu, Y. Toward Amide Linked RNA Mimics: Total Synthesis of 3'-C Branched Uridine Azido Acid via an Ene-Iodolactonization Approach. *Org. Lett.* **2003**, *5*, 181-184.
63. Vedejs,* E.; **Rozners, E.** Parallel Kinetic Resolution Under Catalytic Conditions: A Three-Phase System Allows Selective Reagent Activation Using Two Catalysts. *J. Am. Chem. Soc.* **2001**, *123*, 2428-2429.
64. Lindqvist, M.; Sarkar, M.; Winqvist, A.; **Rozners, E.**; Strömberg, R.; Gräslund,* A. Optical Spectroscopic Study of the Effects of a Single Deoxyribose Substitution in a Ribose Backbone: Implications in RNA-RNA Interaction. *Biochemistry* **2000**, *39*, 1693-1701.
65. Sarkar, M.; Dornberger, U.; **Rozners, E.**; Fritzsche, H.; Strömberg, R.; Gräslund,* A. FTIR Spectroscopic Studies of Oligonucleotides That Model a Triple-Helical Domain in Self-Splicing Group I Introns. *Biochemistry* **1997**, *36*, 15463-15471.
66. **Rozners,* E.**; Strömberg, R. Synthesis and Properties of Oligoribonucleotide Analogs Having Formacetal Internucleoside Linkages. *J. Org. Chem.* **1997**, *62*, 1846-1850.
67. Sarkar, M.; Sigurdsson, S.; Tomac, S.; Sen, S.; **Rozners, E.**; Sjöberg, B. M.; Strömberg, R.; Gräslund,* A. A Synthetic Model for Triple-Helical Domains in Self-Splicing Group I Introns Studied by Ultraviolet and Circular Dichroism Spectroscopy. *Biochemistry* **1996**, *35*, 4678-4688.
68. **Rozners,* E.**; Bizdena, E. Building Blocks for Synthesis of Oligoarabinonucleotides: Preparation of Arabinonucleoside H-Phosphonates from Protected Ribonucleosides. *Nucleosides and Nucleotides* **1995**, *14*, 2009-2025.
69. **Rozners, E.**; Westman, E.; Strömberg,* R. Evaluation of 2'-Hydroxyl Protection in RNA-Synthesis Using the H-Phosphonate Approach. *Nucleic Acids Research* **1994**, *22*, 94-99.
70. **Rozners,* E.**; Renhofa, R.; Petrova, M.; Popelis, Y.; Kumpins, V.; Bizdena, E. Synthesis of Oligoribonucleotides by the H Phosphonate Approach Using Base-Labile 2'-O-Protecting Groups. V. Recent Progress in Development of the Method. *Nucleosides and Nucleotides* **1992**, *11*, 1579-1593.
71. **Rozners, E.**; Renhof, R.; Cielens, I.; Kumpins, V.; Bizdena, E. Synthesis of Oligoribonucleotides by the H-Phosphonate Approach Using Base-Labile 2'-O-Protecting Groups. IV. A New Approach to Solve the Problem of Modification and Degradation of Oligoribonucleotides. *Bioorg. Khim.* **1992**, *18*, 263-271.
72. **Rozners, E.**; Rekis, A.; Bizdena, E. Synthesis of Oligoribonucleotides by the H-Phosphonate Approach Using Base-Labile 2'-O-Protective Groups. III. Studies on Kinetics of 2'-3'-Migration of Aroyl Groups. *Bioorg. Khim.* **1992**, *18*, 107-111.
73. **Rozners, E.**; Rekis, A.; Kumpins, V.; Bizdena, E. Synthesis of Oligoribonucleotides by the H-Phosphonate Method Using Base-Labile 2'-O-Protecting Groups. II. Some Aspects of Use of 2'-O-Benzoyl and Anisoyl Protecting Groups. *Bioorg. Khim.* **1990**, *16*, 1531-1536.
74. **Rozners, E.**; Kumpins, V.; Rekis, A.; Bizdena, E. Solid-Phase Synthesis of Oligoribonucleotides by the H-Phosphonate Method Using 2'-O-Benzoyl Protective Group. *Bioorg. Khim.* **1988**, *14*, 1580-1582.

INVITED CONTRIBUTIONS AND REVIEWS

1. **Rozners, E.** Amides and Other Non-Ionic Backbone Modifications in RNA. In *Handbook of Chemical Biology of Nucleic Acids*, Sugimoto, N. (Editor), Springer Nature, **2023**, published online, https://doi.org/10.1007/978-981-16-1313-5_76-1 (Invited Review).
2. **Rozners, E.** Chemical Modifications of CRISPR RNAs to Improve Gene Editing Activity and Specificity. *J. Am. Chem. Soc.* **2022**, *144*, 12584-12594 (Invited Perspective).
3. Brodyagin, N.; Katkevics, M.; Kotikam, V.; Ryan, C. A.; **Rozners,* E.** Chemical approaches to discover the full potential of peptide nucleic acids in biomedical applications. *Beilstein J. Org. Chem.* **2021**, *17*, 1641-1688 (Invited Review).
4. Kotikam, V.; **Rozners,* E.** Amide-Modified RNA: Using Protein Backbone to Modulate Function of Short Interfering RNAs. *Acc. Chem. Res.* **2020**, *53*, 1782-1790 (**Featured on Cover Page**).
5. Brodyagin, N.; Hnedzko, D.; MacKay, J. A.; **Rozners*, E.** Nucleobase-Modified Triplex-Forming Peptide Nucleic Acids for Sequence-Specific Recognition of Double-Stranded RNA In *Peptide Nucleic Acids. From Chemistry to Animals (Methods in Molecular Biology)*, Nielsen, P. E. (Editor), Springer Nature, **2020**, *2105*, 157-172 (Invited Review).
6. Hnedzko, D.; **Rozners*, E.** Sequence-Specific Recognition of Structured RNA by Triplex-Forming Peptide Nucleic Acids In *Methods in Enzymology (RNA Recognition)*, Hargrove, A. E. (Editor), Elsevier, **2019**, *Vol 623*, 401-416 (Invited Review).
7. **Rozners, E.** RNA Metabolism and Drug Design In *Reviews in Cell Biology and Molecular Medicine*, Meyers, R. A. (Editor), Wiley, **2015**, *vol. 1, issue 3*, 53-95 (Invited Review).
8. **Rozners, E.**; Pilch, D.S.; Egli, M. Calorimetry of nucleic acids. *Current Protocols in Nucleic Acid Chemistry, Chapter 7: Biophysical Analysis of Nucleic Acids* **2015**, 7.4.1-7.4.11 (Invited Review).
9. Hnedzko, D.; Cheruiyot, S. K.; **Rozners*, E.** Using Triple Helix Forming Peptide Nucleic Acids for Sequence-selective Recognition of Double-stranded RNA *Current Protocols in Nucleic Acid Chemistry, Chapter 4: Synthesis of Modified Oligonucleotides and Conjugates* **2014**, 4.60.1-4.60.23 (Invited Review).
10. **Rozners, E.** Sequence Selective Recognition of Double-Stranded RNA In *Chemical Biology of Nucleic Acids: Fundamentals and Clinical Applications, RNA Technologies*. Erdmann, V.A.; Markiewicz W.T. and Barciszewski, J. (Editors), **2014**, 167-180.
11. Zenggeya, T.; Gupta, P.; **Rozners*, E.** Sequence Selective Recognition of Double Stranded RNA using Triple Helix-forming Peptide Nucleic Acids In *Peptide Nucleic Acids: Methods and Protocols (Methods in Molecular Biology)*, Nielsen, P. E. and Appella, D. H. (Editors), Springer Nature, **2014**, *1050*, 83-94 (Invited Review).
12. **Rozners, E.** Recent Advances in Chemical Modification of Peptide Nucleic Acids *Journal of Nucleic Acids*, **2012**, Article ID 518162, 8 pages, doi:10.1155/2012/518162 (Invited Review).
13. **Rozners, E.** Determination of Nucleic Acid Hydration Using Osmotic Stress. *Current Protocols in Nucleic Acid Chemistry, Chapter 7: Biophysical Analysis of Nucleic Acids* **2010**, 7.14.1-7.14.13 (Invited Review).
14. **Rozners, E.** Carbohydrate Chemistry for RNA Interference: Synthesis and Properties of RNA Analogues Modified in Sugar-Phosphate Backbone. *Curr. Org. Chem.* **2006**, *10*, 675-692.
15. **Rozners, E.** Modification of Nucleoside Heterocycles to Probe and Expand Nucleic Acid Structure and Function. *Lett. Org. Chem.* **2005**, *2*, 398-403 (Invited Highlight).
16. Vedejs*, E.; Daugulis, O.; MacKay, J. A.; **Rozners, E.** Enantioselective Acyl Transfer Using Chiral Phosphine Catalysts. *Synlett* **2001**, 1499-1505.

PATENTS

1. **Rozners, E.**; Zenggeya, T. Compositions and methods for recognition of RNA using triple helical peptide nucleic acids U.S. Pat. (2019), US 10,260,088 B2.
2. **Rozners, E.**; Zenggeya, T. Compositions and methods for recognition of RNA using triple helical peptide nucleic acids U.S. Pat. (2019), US 10,385,100 B2.

INVITED LECTURES AND ORAL CONFERENCE PRESENTATIONS

1. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" Tohoku University, Sendai, Japan, July 24, 2023.
2. "Triplex-Forming Peptide Nucleic Acid Controls Dynamic Conformation of RNA" FIBER International Summit for Nucleic Acids (FISNA 2023), Konan University, Kobe, Japan, July 19, 2023.
3. "Amide-Modified Oligonucleotides for Chemical Control of Functional RNAs" Eli Lilly and Company, Indianapolis, IA, March 9, 2023.
4. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" XXIV International Round Table on Nucleosides, Nucleotides and Nucleic Acids, Stockholm, Sweden, August 30, 2022.
5. "Amide-Modified RNA: Synthesis, Structure and Biological Activity" Functional Nucleic Acids: Recent Landscapes and Therapeutic Applications, INDIA-EMBO Lecture Course, Faridabad, India, August 17, 2022.
6. "Amide-Modified RNA: Synthesis, Structure and Biological Activity" FIBER International Summit for Nucleic Acids (FISNA 2022), Konan University, Kobe, Japan, July 13, 2022.
7. "Amide-Modified RNA: Synthesis, Structure and RNA Biological Activity", ACS CERM2022, Ypsilanti, MI, June 8, 2022.
8. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" Nucleic Acid Secondary Structures G4s and Beyond, Joint Webinar Series at Department of Oncology, University Hospital Bonn, Germany, and Department Molecular Medicine, University of Padua, Italy, Virtual presentation, October 28, 2021.
9. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" The 5th Symposium for the Core Research Clusters for Materials Science and Spintronics, and the 4th Symposium on International Joint Graduate Program in Materials Science, Virtual presentation, October 27, 2021.
10. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" TIDES USA, Oligonucleotide & Peptide Therapeutics, Boston, MA, September 22, 2021.
11. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" Melville L. Wolfrom Award Symposium, ACS National Meeting, Atlanta, GA, August 25, 2021.
12. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids", NeuBase Therapeutics, Inc., Pittsburgh, PA, December 10, 2019.
13. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" University of Colorado Denver, Denver, CO, November 8, 2019.
14. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids", Faculty of Materials Science and Applied Chemistry, Riga Technical University, Riga, Latvia, October 21, 2019.
15. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids", 15th Annual Meeting of the Oligonucleotide Therapeutics Society, Munich, Germany, October 14, 2019.
16. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" Latvian Institute of Organic Synthesis, Riga, Latvia, October 11, 2019.
17. "Carbohydrate chemistry for RNA interference: Synthesis, structure, and biological activity of amide-linked RNA" Centennial Celebration of ACS Carbohydrate Chemistry: Chairs' Perspective, 258th ACS National Meeting, San Diego, CA, August 25, 2019.
18. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" Gordon Research Conference on Nucleosides, Nucleotides & Oligonucleotides, June 24, 2019, Salve Regina University, Newport RI.
19. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" Nucleic Acids-Based Therapeutics Symposium, 257th ACS National Meeting, Orlando, FL, April 2, 2019.

20. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids", University of Rochester Medical Center, Rochester, NY, March 27, 2019.
21. "Amide-Modified RNA: Using Protein Backbone to Modulate RNA Function" Workshop for Interaction and Scientific Collaboration (WISC), University at Albany, November 30, 2018.
22. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids", Elizabethtown College, PA, September 26, 2018.
23. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" XXII International Round Table on Nucleosides, Nucleotides and Nucleic Acids, San Diego, CA, August 28, 2018.
24. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" FIBER International Summit for Nucleic Acids (FISNA 2018), Konan University, Kobe, Japan, July 6, 2018.
25. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids", Latvian Institute of Organic Synthesis, Riga, Latvia, June 21, 2018.
26. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" iConChem2018 International Conference in Chemistry, Indian Institute of Science, Education and Research, Tirupati, India, May 24, 2018.
27. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" Department of Chemistry, University of Pennsylvania, Philadelphia, PA, April 26, 2018.
28. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" PNA Innovations/TruCode Gene Repair, Inc., Woburn, MA, November 3, 2017.
29. "Sequence Selective Recognition of Double-Stranded RNA by Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" Department of Chemistry, Michigan State University, East Lansing, MI, September 6, 2017.
30. "Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids for Sequence Selective Recognition of Double-Stranded RNA" FIBER International Summit for Nucleic Acids (FISNA 2017), Konan University, Kobe, Japan, July 19, 2017.
31. "Carbohydrate Chemistry for RNA Interference: Synthesis, Structure and Biological Activity of Amide-Linked RNA" Gordon Research Conference on Carbohydrates, Mount Snow, West Dover, VT, June 29, 2017.
32. "Amide-Modified RNA Synthesis, Structure and RNA Interference Activity" Plenary Lecture, The 10th Paul Walden Symposium, Riga, Latvia, June 15, 2017.
33. "Sequence selective recognition of double-stranded RNA by cationic nucleobase and backbone-modified peptide nucleic acids" 14th Annual Conference Foundations of Nanoscience (FNANO), Snowbird, UT, April 13, 2017
34. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" FIBER Future College International Lectures in NanoBioNow Series, Konan University, Kobe, Japan, December 6, 2016.
35. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity", Elizabethtown College, PA, September 9, 2016.
36. "Sequence Selective Recognition of Double-Stranded RNA and Enhanced Cellular Uptake of Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids" FIBER International Summit for Nucleic Acids (FISNA 2016), Konan University, Kobe, Japan, July 6-8, 2016.
37. "Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids for Sequence Selective Recognition of Double-Stranded RNA" 2016 Telluride Workshop on Nucleic Acid Chemistry, Telluride, CO, July 25-29, 2016.
38. "Sequence Selective Recognition of Double-Stranded RNA Using Cationic Peptide Nucleic Acids" Elizabethtown College, PA, September 11, 2015.
39. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" SUNY Potsdam, NY, November 3, 2015.
40. "Sequence Selective Recognition of Double-Stranded RNA Using Cationic Peptide Nucleic Acids" St. Lawrence University, Canton, NY, November 3, 2015.
41. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" 250th ACS National Meeting, Boston, MA, August 16, 2015.

42. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" Dharmacon, GE Healthcare, Lafayette, CO, March 24, 2015.
43. "Amide-Modified RNA: Synthesis, Structure and RNA Interference Activity" SUNY Oneonta, April 27, 2015.
44. "Sequence Selective Recognition of Double-Stranded RNA Using Cationic Peptide Nucleic Acids" Invited talk at the IUPAC 10th International Symposium on Bio-Organic Chemistry, Indian Institute of Science, Education and Research, Pune, India, January 11-15, 2015.
45. "Sequence-Selective Recognition of Double-Stranded RNA Using Triple Helix Forming Peptide Nucleic Acids" Novartis Institutes for BioMedical Research, Cambridge, MA, September 25, 2014.
46. "Sequence Selective Recognition of Double-Stranded RNA Using Nucleobase-Modified Peptide Nucleic Acids" 248th ACS National Meeting, San Francisco, CA, August 12, 2014.
47. "Sequence-Selective Recognition of Double-Stranded RNA Using Triple Helix Forming Peptide Nucleic Acids" Nucleic Acid Research & Development Conference, San Diego, CA, June 19-20, 2014.
48. "Synthesis and properties of amide-modified RNA for applications in RNA interference" 247th ACS National Meeting, Dallas, TX, March 18, 2014.
49. "Amide-Modified RNA: Synthesis, Properties and Applications in RNA Interference" Gunma University, Kiryu, Japan, November 16, 2013.
50. "Sequence Selective Recognition of Double Helical RNA Using Nucleobase and Backbone-Modified PNA" The 40th International Symposium on Nucleic Acid Chemistry (ISNAC2013), invited plenary talk, Kanagawa University, Yokohama, Japan, November 14, 2013.
51. "Amide-Modified RNA: Synthesis, Properties And Applications in RNA Interference" FIBER Forum, Konan University, Kobe, Japan, November 11, 2013.
52. "Nonionic Nucleic Acid Analogues: Synthesis, Properties And Applications in RNA Interference" 246th ACS National Meeting, Indianapolis, IN, September 10, 2013.
53. "Sequence Selective Recognition of Double Helical RNA Using Nucleobase-Modified Peptide Nucleic Acids (PNA)" Queens College CUNY, Queens, NY, November 5, 2012.
54. "Nonionic Nucleic Acid Analogues: Synthesis, Properties And Applications in RNA Interference" Department of Chemistry, Saint Francis University, Loretto, PA, September 28, 2012.
55. "Sequence Selective Recognition of Double Helical RNA by Nucleobase-Modified Peptide Nucleic Acids" Faculty of Materials Science and Applied Chemistry, Riga Technical University, September 21, 2012, Riga, Latvia.
56. "Nonionic Nucleic Acid Analogues: Synthesis, Properties And Applications in RNA Interference" Latvian Institute of Organic Synthesis, Riga, Latvia, September 19, 2012.
57. "Sequence Selective Recognition of Double Helical RNA Using PNA", XX International Round Table on Nucleosides, Nucleotides and Nucleic Acids, Montreal, Canada, August 6, 2012.
58. "Sequence Selective Recognition of Double Helical RNA Using Nucleobase-Modified Peptide Nucleic Acids (PNA)" RNA Institute, University at Albany, June 12, 2012.
59. "Sequence Selective Recognition of Double Helical RNA Using Nucleobase-Modified Peptide Nucleic Acids (PNA)" Department of Chemistry, Rice University, April 18, 2012.
60. "Synthesis and Properties of Non-Ionic RNA Analogues for Applications in RNA Interference" Department of Chemistry, University of Houston, April 16, 2012.
61. "Synthesis and Properties of Non-Ionic RNA Analogues for Applications in RNA Interference" Department of Chemistry, University of Rochester, March 9, 2012.
62. "Sequence Selective Recognition of Double Helical RNA by Nucleobase-Modified PNA" Department of Chemistry, Carnegie-Mellon University, April 21, 2011.
63. "Nonionic Nucleic Acid Analogues: Synthetic, Structural and Biophysical Studies", Molecular Toxicology Program, Vanderbilt University, April 18, 2011.
64. "Hydrophobic Nucleic Acid Analogues: Synthesis, Biophysical Studies and RNA Recognition" Department of Chemistry, Adelphi University, October 20, 2010.

65. "Synthesis and Biophysical Studies of Hydrophobic RNA Analogues" Department of Chemistry, Hartwick College, December 4, 2008.
66. "Synthesis and Biophysical Studies of Hydrophobic RNA Analogues" Department of Chemistry, Skidmore College, November 5, 2008.
67. "Interplay of chemical modifications and hydration in RNA studied using osmotic stress" 234th ACS National Meeting, August 20, 2007, Boston, MA.
68. "Synthesis and Properties of Nonionic RNA Analogues" Gordon Research Conference on Nucleosides, Nucleotides & Oligonucleotides, July 4, 2007, Salve Regina University, Newport RI.
69. "Synthesis and Properties of RNA Modified in Sugar-Phosphate Backbone" Dharmacon RNA Technologies, ThermoFisher Scientific, May 3, 2007, Lafayette, CO.
70. "Synthesis and Properties of RNA Modified in Sugar-Phosphate Backbone" presented to the Chemistry Interest Group at NIH, November 17, 2006, Bethesda, MD.
71. "Synthesis and Properties of RNA Modified in Sugar-Phosphate Backbone" Alnylam Pharmaceuticals, April 7, 2006, Cambridge, MA.
72. "Stereoselective synthesis and properties of nonionic RNA analogues" (CARB065) 231th ACS National Meeting, March 29, 2006, Atlanta, GA.
73. "Non-Ionic RNA Analogues: Stereoselective Synthesis, Biophysical Properties, and Biological Relevance" Chemistry & Biochemistry Department, University of Massachusetts Dartmouth, November 2, 2005, MA.
74. "Non-Ionic RNA Analogues: Stereoselective Synthesis, Biophysical Properties, and Biological Relevance" Plenary Lecture at the Paul Valden 4th Symposium on Organic Chemistry, September 15, 2005, Riga, Latvia.
75. "Synthesis and Properties of Non-Ionic RNA Mimics" Department of Chemistry, University of Connecticut, November 17, 2004, Storrs, CT.
76. "Amide Linked RNA: A Novel Biopolymer Mimic" Plenary Lecture at the Balticum Organicum Syntheticum, June 30, 2004, Riga, Latvia.
77. "Amide Bonded RNA: Total Synthesis of Biopolymer Mimics" Latvian Institute of Organic Synthesis, June 17, 2004, Riga, Latvia.
78. "The Role of Water in Structure of Nucleic Acids" Faculty of Materials Science and Applied Chemistry, Riga Technical University, June 15, 2004, Riga, Latvia.
79. "Amide Linked RNA: A Novel Biopolymer Mimic" Chemistry Department, St. Norbert College, October 20, 2003, De Pere, WI.
80. "Amide Linked RNA: A Novel Biopolymer Mimic" Chemistry Department, University of Wisconsin-Green Bay, October 21, 2003, Green Bay, WI.
81. "Amide Linked RNA: A Novel Biopolymer Mimic", Chemistry Department, Lawrence University, October 22, 2003 Appleton, WI.
82. "Synthesis of Oligoribonucleotides by the H-Phosphonate Approach Using Base Labile 2'-O-Protecting Groups" International Symposium: Synthetic Oligonucleotides: Problems and Frontiers of Practical Application; June 25, 1991, Moscow, USSR.

TEACHING COURSES (BINGHAMTON UNIVERSITY)

1. Fall 2008	Stereoselective Organic Synthesis	(enrolled 5)	Chem 483L/583L
2. Spring 2009	Chemical Synthesis	(enrolled 17)	Chem 432/532
	Frontiers in Chemistry	(enrolled 17)	Chem 593
3. Fall 2009	Organic Chemistry 2	(enrolled 63)	Chem 332
	Frontiers in Chemistry	(enrolled 8)	Chem 593
4. Spring 2010	Chemical Synthesis	(enrolled 19)	Chem 432/532
	Frontiers in Chemistry	(enrolled 7)	Chem 593
5. Fall 2010	Advanced Organic Laboratory (Experimental course, new development)	(enrolled 8)	Chem 435X
6. Spring 2011	Organic Chemistry 1	(enrolled 70)	Chem 231
7. Fall 2011	Advanced Organic Laboratory (Experimental course, new development)	(enrolled 8)	Chem 435X
8. Spring 2012	Chemical Synthesis	(enrolled 17)	Chem 432/532
9. Fall 2012	Stereoselective Organic Synthesis	(enrolled 15)	Chem 483L/583L
10. Spring 2013	Organic Chemistry 1	(enrolled 90)	Chem 231
11. Fall 2013	Organic Chemistry 2	(enrolled 80)	Chem 332
12. Spring 2014	Chemical Synthesis	(enrolled 12)	Chem 432/532
13. Fall 2014	Stereoselective Organic Synthesis	(enrolled 6)	Chem 483L/583L
14. Spring 2015	Chemical Synthesis	(enrolled 14)	Chem 432/532
15. Fall 2015	Physical Organic Chemistry	(enrolled 10)	Chem 431/531
16. Spring 2016	Chemical Synthesis	(enrolled 16)	Chem 432/532
17. Spring 2017	Organic Chemistry 1	(enrolled 130)	Chem 231
18. Spring 2018	Organic Synthesis	(enrolled 3)	Chem 432/532
19. Spring 2019	Organic Synthesis	(enrolled 25)	Chem 432/532
20. Spring 2020	Organic Synthesis	(enrolled 15)	Chem 432/532
21. Spring 2022	Organic Synthesis	(enrolled 14)	Chem 432/532
22. Spring 2023	Organic Synthesis	(enrolled 4)	Chem 432/532

TEACHING HONORS

- **Extraordinary Contribution Award** for outstanding service to students with disabilities or who are deaf or hard of hearing, Northeastern University, The Disability Resource Center, May 2002.

ADVISOR FOR GRADUATE STUDENTS**Northeastern University**

1. Yang Liu, **Ph.D.**, thesis "Toward Total Synthesis of Amide-Linked RNA" April 2006.
2. Qun Xu, **Ph.D.**, thesis "Toward Amide-Linked RNA: Synthesis of 3',5'-Branched Nucleosides" December 2005.
3. Yuan Pingwei, **M.S.**, thesis "New Peptide-Based Ligand for the Nozaki-Hiyama-Kishi Reaction" August 2005.
4. Vijayalaskhmi Ramanan, **M.S.**, thesis "Studies toward Synthesis of Formacetal Modified Oligoribonucleotides" April 2005.
5. Swapna Suresh, **M.S.**, thesis "Synthesis of Protected 5'-Aminouridine for Modification of Solid-Support in Synthesis of Modified siRNA" June 2008.

Binghamton University

6. Vincent Sica, **M.S.**, thesis "Discovery, Design, and Synthesis of Ligands for the Enantioselective Nozaki-Hiyama-Kishi Reaction", December 2011.
7. Eric Dumas, **M.A.**, December 2011.

8. Paul Tanui, **Ph.D.**, thesis “Design and Synthesis of Amide-Linked Ribonucleic Acids for Potential Application in RNA Interference”, July 2013.
9. Thomas Zengeya, **Ph.D.**, thesis “Sequence Selective Recognition of Double Helical RNA Using Nucleobase-Modified PNA”, August 2013.
10. Oluwatoyosi Muse, **Ph.D.**, thesis “Sequence Selective Recognition of Double-Stranded RNA by Cationic Peptide Nucleic Acids”, December 2013.
11. Daniel Mutisya, **Ph.D.**, thesis “Synthesis, biophysical properties and biological activity of non-ionic RNA analogues having triazole and amide internucleoside linkages” December 2013.
12. Dziyana Hnedzko, **Ph.D.**, thesis “Sequence-Selective Recognition of Double-Stranded RNA and Enhanced Cellular Uptake of Cationic Nucleobase and Backbone-Modified Peptide Nucleic Acids”, March 2017.
13. Samwel Cheruiyot, **Ph.D.**, thesis “Design, Synthesis and Biophysical Properties of Amide Modified Nucleic Acid Analogues for Biological Applications in RNA Interference and Imaging”, May 2017.
14. Matthew Grobstein, M.A., May 2021.
15. Julien Gago-Viel, **Ph.D.**, thesis “Synthesis and Biological Activity of Amide-Linked RNA”, May 2021.
16. Nikita Brodyagin, **Ph.D.**, thesis “Triple-Helical Recognition of Double-Stranded RNA with Chemically Modified Peptide Nucleic Acid and Enhanced Cellular Uptake of Peptide Nucleic Acid-Peptide Conjugates”, May 2021.
17. Christopher Ryan, **Ph.D.**, thesis “The Biophysics of Peptide Nucleic Acid Binding to Duplex RNA and its Application in Targeting Biologically Relevant Structured RNA”, May 2023.
18. Michael Richter, current Ph.D. student.
19. Ilze Kumpina, current Ph.D. student.
20. Sayed Habibul Gafur, current M.S. student.
21. Brandon Tessier, current Ph.D. student.
22. Sara Farshineh Saei, current Ph.D. student.

ADVISOR FOR POSTDOCTORAL RESEARCH ASSOCIATES

Northeastern University

- | | |
|----------------------|-------------------|
| 1. Romualdas Smicius | 09/2002 – 08/2003 |
| 2. Andrej Kolarovic | 02/2005 – 01/2006 |
| 3. Martin Kullberg | 05/2007 – 04/2008 |
| 4. Siji Thomas | 06/2007 – 06/2008 |

Binghamton University

- | | |
|--------------------------|-------------------|
| 5. Ming Li | 07/2008 – 06/2009 |
| 6. Thilagavathi Ramasamy | 10/2009 – 02/2010 |
| 7. Pankaj Gupta | 10/2009 – 08/2011 |
| 8. Selvam Chelliah | 08/2008 – 09/2011 |
| 9. Mahesh Sonar | 07/2014 – 01/2015 |
| 10. Irina Novosjolova | 08/2015 – 10/2017 |
| 11. Venubabu Kotikam | 09/2015 – 08/2021 |
| 12. Vipin Kumar | 07/2019 – 02/2021 |
| 13. Praveen Kumar Gajula | 08/2019 – 12/2020 |
| 14. Chandan Pal | 08/2021 – current |
| 15. Motiar Rahman | 10/2021 – current |
| 16. Mohammed Loubidi | 04/2022 – 03/2023 |
| 17. Samir Ghosh | 09/2022 – current |
| 18. Jayamini Harasgama | 09/2022 – current |

MENTORING UNDERGRADUATE RESEARCHERS

Since 2002 I have mentored more than 60 undergraduate researchers, including several students from groups underrepresented in sciences. I have served as a faculty mentor for NIH Bridges to Baccalaureate program at Binghamton during summers of 2009-2014. Mentored 13 minority undergraduate researchers: Jean-Luc Noel (summer 2009) Monique Thomas (summer 2010), Ruby Boateng and Elijah Noble (summer 2011), Ignatius K Ukatu (summer 2012), Nyssa Clausell and Gaddi Eshun (summer 2013), Tumininu Faniyan and Chantal Williams (summer 2014), Breonna Robinson (summer 2015), Brulinda Frangaj and Ervin Coaxum (summer 2016), and Faisal King (summer 2021).

Thirteen undergraduate students have contributed as co-authors to peer-reviewed publications:

Binghamton students: Yashodhan Chivate, Emma Schweizer, Emily Greene (three publications), Mark Gironda, Michael Paolillo, Artem Gindin, Yannis Karamitas, Justin Applegate, Justin Lok, and Lamorna Coyle (two publications).

Honors Thesis,

1. Emily Greene "Hydration of Fluorine-Modified DNA and RNA", May 2012
2. Michael Paolillo "Studies of Fluorine Modified DNA and RNA", May 2013

Northeastern students: Steven Mathieu, Chika Uchiyama, Juan Fontanez and Janelle Moulder. The collaboration with Janelle Moulder was part of the Northeastern University NSF Louis Stokes Alliance for Minority Participation Program, where I was acting as a faculty mentor.

DEPARTMENTAL SERVICE

- Chairmen of Chemistry Department (2017 – 2023)
- Chair of Graduate Program Committee (2014 – 2017)
- Graduate Program Committee (2013 – 2014)
- Chair of Undergraduate Program Committee (2009 – 2013).
- Chair of Organic Chemistry/Biochemistry Faculty Search Committee (2011 – 2012).
- Chair of NMR users committee and coordinator of NMR proposals. NSF MRI proposal for 600 MHz instrument was funded in August 2009.
- Colloquium Program (Spring 2009 – Spring 2010, 3 semesters).
- Chair of Safety/Hazardous Waste Committee (2008 – 2009).

HARPUR COLLEGE SERVICE

- Educational Policy and Priorities Committee (2012 – 2013).
- Academic Honesty Committee (April, 2012).

BINGHAMTON UNIVERSITY SERVICE

- All-University Personnel Committee (2012 – present).

OTHER PROFESSIONAL SERVICE

- Ad hoc grant proposal reviewer for international funding agencies:
 - 1) Internal research group proposals for Institut Pasteur, Paris, France (September 2009).
 - 2) Research Foundation – Flanders, Odysseus funding programme, Brussel, Belgium (October 2017).
 - 3) Israel Science Foundation (March 2018 and April 2021).
 - 4) A*STAR Agency for Science, Technology, Singapore (December 2018).
 - 5) Austrian Science Fund (October 2019).
 - 6) Swiss National Science Foundation (June 2021).
 - 7) National Science Center, Poland (September 2021)
- Grant proposal reviewer for *The Petroleum Research Fund* (American Chemical Society).
- Symposium Organizer “Advances in molecular recognition of double-helical DNA and RNA”, Division of Carbohydrate Chemistry, 255th ACS National Meeting, New Orleans, LA, March 19-20, 2018.
- Symposium Organizer “Frontiers of Nucleic Acid Chemistry”, Division of Carbohydrate Chemistry, 247th ACS National Meeting, Dallas, TX, March 18-19, 2014.
- Discussion Leader for “Alternative Chemistries of Life”, NSF/NASA Workshop, April 2012, Washington DC.
- Guest Editor, *Journal of Nucleic Acids*, Special Issue on “Artificially Created Nucleic Acids and Peptides/Proteins in Chemical Biology”, 2012.
- Thesis Reviewer for *Adam Katolik* (2015, McGill University, Canada), *Manojkumar Varada* (2015, Pune University, India), *Satheesh Ellipilli* (2015, IISER, Pune, India), *Manoj Kumar Gupta* (2019, IISER, Pune, India), *Leonora Abdullahu* (2021, McGill University, Canada).
- Regular referee for *Angewandte Chemie*, *Journal of the American Chemical Society*, *Nucleic Acids Research*, *ACS Chemical Biology*, *Nature Chemistry*, *Nature Communications*, *RNA*, *Chemical Communications*, *Organic Letters*, *Journal of Organic Chemistry*, *Analytical Chemistry*, *Chemical Reviews*, *Organic and Biomolecular Chemistry*, *Chemical Research in Toxicology*, *Tetrahedron Letters*, *Tetrahedron Asymmetry* and *Bioorganic and Medicinal Chemistry Letters*.